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(54) COVER TAPE

(57)Abstract:

PROBLEM TO BE SOLVED: To obtain a cover tape reduced in the seal temperature dependence and change with the elapse of time of peel strength and excellent in transparency, low temperature sealability and blocking resistance.

SOLUTION: The cover tape has an intermediate layer formed using a thermally reversible crosslinkable resin composition and further consists of a biaxially stretched resin layer, the intermediate layer formed using the thermally reversible crosslinkable resin composition and a heat-sealing layer. The heat-sealing layer contains an ethylene/vinyl acetate copolymer resin, a fatty acid amide type blocking inhibitor and a granular blocking inhibitor. The ethylene/vinyl acetate copolymer resin consists of 0-30 wt.% of an ethylene/vinyl acetate copolymer resin (A) with a glass transition point of 40- $<65^{\circ}\text{C}$, 0-100 wt.% of an ethylene/vinyl acetate copolymer resin (B) with a glass transition point of 65- $<85^{\circ}\text{C}$ and 0-75 wt.% of an ethylene/vinyl acetate copolymer resin (C) with a glass transition point of 85- $<105^{\circ}\text{C}$.

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CLAIMS

[Claim(s)]

[Claim 1] The covering tape which has the middle class who consists of a heat reversible cross-linking resin constituent.

[Claim 2] The covering tape which consists of a biaxial-stretching resin layer, the middle class who consists of a heat reversible cross-linking resin constituent, and a heat-sealing layer.

[Claim 3] It consists of a biaxial-stretching resin layer, an interlayer who consists of a heat reversible cross-linking resin constituent, and a heat-sealing layer. A heat-sealing layer comes to contain ethylene-vinyl acetate copolymerization resin, a fatty-acid AMAIDO system antiblocking agent, and a particle-like antiblocking agent. The covering tape on which a glass transition point consists [this ethylene-vinyl acetate copolymerization resin] of 0 - 30 % of the weight of things below more than (A) 40 degree-C65 degree C, 0 - 100 % of the weight of things below more than (B) 65 degree-C85 degree C, and 0 - 75 % of the weight of things below more than (C) 85 degree-C105 degree C.

[Claim 4] The covering tape of claim 3 whose melting point of a fatty-acid AMAIDO system antiblocking agent is 70-120 degrees C.

[Claim 5] The covering tape of claim 3 or claim 4 0.01 - 4 % of the weight and whose particle-like antiblocking agent a fatty-acid AMAIDO system antiblocking agent is 0.01 - 4 % of the weight to ethylene-vinyl acetate copolymerization resin.

[Claim 6] A covering tape given in any 1 term of claim 3 to claim 5 which comes to manufacture ethylene-vinyl acetate copolymerization resin from the ethylene-vinyl acetate copolymerization resin of a water-emulsion system.

[Claim 7] A covering tape given in any 1 term of claim 1 which performed antistatic treatment to at least one side of a covering tape to the bill 6.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]**[0001]****[Field of the Invention]** This invention relates to a covering tape.**[0002]**

[Description of the Prior Art] Various electronic parts including IC are contained by the carrier tape made from plastics on which the pocket was fabricated continuously, and after having been enclosed by the covering tape which can be heat sealed, they are supplied. [many] Electronic parts are automatically taken out, after exfoliating a covering tape from a carrier tape, in case a surface mount is carried out to an electronic-circuitry substrate. Sheets plastic, such as a product made of polystyrene resin with easy embossing shaping for the carrier tape made from plastics or a product made of polyvinyl chloride resin, are mainly used. Many things which carried out the laminating of the heat-sealing layer which consists of a resin constituent with what used the PET film etc. as the base material and generally coated hot melt adhesive on a covering tape, heat-sealing nature, and open-easiness are used.

[0003]

[Problem(s) to be Solved by the Invention] In case it removes from a carrier tape, a carrier tape vibrates that peel strength is large or it is uneven on such a covering tape at the time of exfoliation, and it is asked for what the phenomenon which that electronic parts jump out etc. does not have does not generate. Moreover, a covering tape has that desirable from which it is hard to produce blocking even if it keeps it under an elevated temperature and under highly humid for a long period of time, where a seal is carried out to an itself or carrier tape, and peel strength does not change remarkably compared with storage before. Furthermore, that from which the bond strength (peel strength) of a heat-sealing layer and a carrier tape does not change notably to seal temperature is called for, and is.

[0004]

[Means for Solving the Problem] This invention is a covering tape which has the middle class who comes to use a heat reversible cross-linking resin constituent. Furthermore, a biaxial-stretching resin layer, the interlayer who comes to use a heat reversible cross-linking resin constituent, Are the covering tape which consists of a heat-sealing layer, and this heat-sealing layer comes to contain ethylene-vinyl acetate copolymerization resin, a fatty-acid AMAIDO system antiblocking agent, and a particle-like antiblocking agent. Covering tape **** which a glass transition point becomes [this ethylene-vinyl acetate copolymerization resin] from 0 - 30 % of the weight of things below more than (A) 40 degree-C65 degree C, 0 - 100 % of the weight of things below more than (B) 65 degree-C85 degree C, and 0 - 75 % of the weight of things below more than (C) 85 degree-C105 degree C. This covering tape has the small seal temperature dependence of peel strength, and it is excellent in transparency, low-temperature seal nature, and blocking resistance. Moreover, since this invention can manufacture a heat-sealing layer from the ethylene-vinyl acetate copolymerization resin emulsion of a drainage system, it does not need to use an organic solvent.

[0005]

[Embodiment of the Invention] In this invention, a heat reversible cross-linking resin constituent is used for an interlayer. The bond strength of a covering tape is remarkably influenced by the adhesion of a heat-sealing layer and a carrier tape, is accumulated, in order to improve adhesion, it prepares a thermoplastics layer between a biaxial-stretching resin layer and a heat-sealing layer, and it makes a cushioning material-role bear generally. However, in the common thermoplastics which is not a heat reversible cross-linking resin constituent, with the temperature which carries out a seal, although it was thermoplasticity therefore, the difference remarkable in cushioning properties arose, this led to the difference with remarkable peel

strength, as a result it had become the cause of the unevenness of peel strength. The point heat reversible cross-linking resin constituent can be used as the covering tape which does not have a remarkable change of cushioning properties since the structure of cross linkage is maintained in 100-200 degrees C which is practical seal temperature, and therefore does not have a difference remarkable in peel strength.

[0006] The heat reversible cross-linking resin constituent used for this interlayer is a resin constituent which will form bridge formation if temperature becomes low, and bridge formation dissociates at an elevated temperature. It is the resin constituent which comes to contain the polyhydric-alcohol compound which has the denaturation polyolefine which has carboxylic anhydride structure preferably, and two or more hydroxyl groups. To this resin constituent, a reaction accelerator can be further used together. The resin constituent of a publication can be suitably used for JP,6-57062,A, JP,7-94029,A, and JP,11-106578,A.

[0007] With the biaxial-stretching resin layer of this invention, polyester, nylon, polypropylene, etc. are mentioned and the film which carried out biaxial stretching especially of these is suitable from the point of a price or workability. Moreover, the film which performed corona treatment etc. can also be used from the purpose which strengthens more bond strength with the antistatic treatment article of a biaxially oriented film, or an interlayer.

[0008] the ethylene-vinyl ester represented by ethylene-vinyl acetate copolymerization resin with the water-emulsion system adhesives which use the ethylene-vinyl acetate copolymerization resin of this invention as a principal component -- duality -- everything but a copolymerization object -- a vinyl chloride -- The ternary polymerization object which copolymerized the third monomer, such as an acrylic acid, a maleic acid, allyl glycidyl ether, and n-methylol acrylamide, is mentioned. Although the bridge formation object which copolymerized ethylene-vinyl acetate copolymerization resin or the third monomer preferably is used and especially the content of the ethylene-vinyl acetate copolymerization resin in a drainage system solvent is not specified, 30 - 75% of the weight of the thing is used. Although water, water / alcoholic mixed solvent is mentioned and a drainage system solvent does not specify especially, water / isopropyl alcohol mixed solvent is used preferably.

[0009] As ethylene-vinyl ester copolymerization resin preferably used for this invention, ethylene-vinyl acetate copolymerization resin mentions and it is ****. In this invention, if seal temperature low dependency-ization of blocking resistance and peel strength is attained and there is (more A) whose glass transition point is 40 degrees C or more less than 65 degrees C by using the ethylene-vinylacetate copolymer with which glass transition points differ by the specific ratio than 30 % of the weight, although low-temperature seal nature becomes good, it becomes easy to block and is not practical. In this case, although it is possible to control by adding an antiblocking agent, when the environment at the time of covering tape storage and transportation is taken into consideration, that effectiveness is not enough, and it is not desirable in order to spoil remarkably the transparency which is the description of this invention, when sufficient blocking tightness is made to give. Moreover, in (C) which is (B) which is 65 degrees C or more less than 85 degrees C, and 85 degrees C or more less than 105 degrees C, if it uses together with mixing or (A), the remarkable blocking prevention effectiveness will be acquired by optimum dose ***** in an antiblocking agent, but independent and since [if (C) exceeds 75 % of the weight,] low-temperature seal nature will no longer be obtained, a glass transition point is not desirable.

[0010] Although organic and an inorganic particle filler are well-known and can also use these as an antiblocking agent, especially in this invention, it is specifying the glass transition point of the ethylene-vinyl acetate copolymerization resin to be used, and using together the antiblocking agent of a fatty-acid AMAIDO system, and a particle-like antiblocking agent, and coexistence of blocking resistance, low-temperature seal nature, and transparency is enabled.

[0011] What has the melting point in 70-120 degrees C as an antiblocking agent of a fatty-acid AMAIDO system is used preferably. As the example, oleic acid AMAIDO, erucic-acid AMAIDO, lauric-acid AMAIDO, N-stearyl stearin acid AMAIDO, palmitic-acid AMAIDO, behenic acid AMAIDO, Stearin acid AMAIDO, palmitic-acid AMAIDO, methylol stearin acid AMAIDO, Methylol behenic acid AMAIDO, ethylene bis-isostearic acid AMAIDO, ethylene bis-oleic acid AMAIDO, hexa methylenebis oleic acid AMAIDO, N, and N'-dioleoyl sebacic-acid AMAIDO etc. is mentioned. As for the antiblocking agent of these fatty-acids AMAIDO system, distributing in water-emulsion system adhesives is desirable, therefore what has a 3-50-micrometer diameter at the time of distribution is desirable.

[0012] Moreover, as a particle-like antiblocking agent, after stoving of water-emulsion system adhesives, plastics particles, such as an inorganic system particle, polystyrene resin particles (oxidization silicon, an aluminum oxide, a calcium carbonate, titanium oxide, etc.), an acrylic resin particle, a silicone resin particle, and a polyethylene resin particle, can be mentioned, and oxidization silicon is raised preferably that what is

necessary is just what can hold the particle condition at the time of spreading.

[0013] The mean diameter of a particle-like antiblocking agent has desirable 3-20 micrometers, and in 3 micrometers or less, the good blocking prevention effectiveness is no longer acquired, and if larger than 20 micrometers, low-temperature seal nature and the dependency of the peel strength to seal temperature will serve as size.

[0014] In addition, it is indispensable to use these antiblocking agents together in this invention, and concomitant use of a fatty-acid AMAIDO system antiblocking agent and an oxidation silicon particle is especially desirable. A fatty-acid AMAIDO system antiblocking agent is 0.1 - 4 % of the weight to total weight making blocking resistance and transparency give coincidence, and it is desirable that a particle-like antiblocking agent is especially 0.1 - 4 % of the weight. At less than 0.1 % of the weight, the blocking prevention effectiveness is not acquired for the addition of a fatty-acid AMAIDO system antiblocking agent, but if 4 % of the weight is exceeded, low-temperature seal nature will be checked. Moreover, at less than 0.1 % of the weight, the blocking prevention effectiveness is not acquired for a particle-like antiblocking agent, but if 4 % of the weight is exceeded, while low-temperature seal reinforcement and transparency will be spoiled, workability, such as a coating activity, falls.

[0015] The obtained water-emulsion system adhesives may be applied to the covering tape of this invention by one side of the above-mentioned film. either the in-line coat method well-known as the approach of a coat, or the off-line coat method -- although -- it can apply and, specifically, can carry out by the Ayr knife coat method, the curtain coat method, the roller coat method, the gravure coat method, the bar coat method, etc.

[0016] Antistatic treatment is performed to at least one side of the above-mentioned covering tape. In this invention, although it is possible to apply an antistatic-agent solution to a biaxial-stretching resin stratification plane or a heat-sealing stratification plane by the above-mentioned approach etc., since a heat-sealing layer is made to form by applying water-emulsion system adhesives by the above-mentioned approach, it is mixing an antistatic agent beforehand in these water-emulsion system adhesives, and the antistatic treatment of a heat-sealing layer can also be made by this invention. As an antistatic agent, any of non-ion systems, such as both-sexes systems, such as anion systems, such as cation systems, such as an amide cation, acyl choline chloride, and an alkyl trimethylammonium salt, an alkyl sulfonate, a phosphoric ester salt, and an alkyl sulfonate salt, an imidazoline mold, an alanine mold, and an ARUKI betaine, a fatty-acid monoglyceride, polyoxyethylene alkylamine, and polyoxyethylene alkyl phenyl ether, and a conductive impalpable powder distribution solution system are sufficient. Thus, the surface resistivity of the obtained covering tape [finishing / antistatic nature processing] has the common range of 101-1012ohms / **, its range of 106-1012ohms / ** is desirable, and its further 108-1012ohms / ** are desirable.

[0017]

[Example] Hereafter, an example explains this invention concretely.

The water-emulsion system adhesives whose glass transition point of example 1 ethylene-vinyl acetate copolymerization resin is less than [more than (A) 40 degree-C65 degree C] (THE ink tech company make), (B) Water-emulsion system adhesives which are 65 degrees C or more less than 85 degrees C (THE ink tech company make), (C) Ethylene-vinyl acetate copolymerization resin carries out comparatively the water-emulsion system adhesives (THE ink tech company make) which are 85 degrees C or more less than 105 degrees C, and (A):(B): (C) blends by the weight ratio of 25:50:25. it -- as an antiblocking agent -- stearin acid AMAIDO (the Nippon Kasei Chemical Co., Ltd. make --) Ethylene-vinyl acetate copolymerization resin is received in the melting point of 102 degrees C. 0.2 % of the weight, What mixed the silica (Japanese silica company make) 1% of the weight The gravure reverse coat of a biaxial extension polyethylene terephthalate film and the heat reversible cross-linking resin constituent (REXPEARL by the Japanese polyolefine company) was carried out to the laminated film which carried out dry laminate by the isocyanate system anchor coat agent as a base material layer and the middle class. The thickness of the heat-sealing layer after desiccation was 10 micrometers.

Example 2 (A): (B) It carried out like the example 1 except having made : (C) into the weight ratio of 0:100:0, and having set thickness of the heat-sealing layer after desiccation to 3 micrometers.

Example 3 (A): (B) It carried out like the example 2 except having made : (C) into the weight ratio of 0:30:70.

Example 4 (A): (B) It carried out like the example 2 except having made : (C) into the weight ratio of 25:0:75.

Example 5 (A): (B) : (C) was made into the weight ratio of 0:100:0, and the silica was added for stearin acid AMAIDO 1% of the weight 0.2% of the weight as an antiblocking agent the 4 % of the weight (Konishi

make) of the amount type antistatic agents of acrylic macromolecules. The gravure reverse coat was carried out to the laminated film which carried out dry laminate of a biaxial extension polyethylene terephthalate film and the heat reversible cross-linking resin constituent (REXPEARL by the Japanese polyolefine company) by the urethane system anchor coat agent by making this into a base material layer and the middle class. The thickness of the heat-sealing layer after desiccation was 3 micrometers.

[0018] The water-emulsion system adhesives whose Tg of example of comparison 1 ethylene-vinyl acetate copolymerization resin is less than [more than (A) 40 degree-C 65 degree C] (THE ink tech company make), (B) Water-emulsion system adhesives which are 65 degrees C or more less than 85 degrees C (THE ink tech company make), (C) (A):(B): (C) blends the water-emulsion system adhesives (THE ink tech company make) which are 85 degrees C or more less than 105 degrees C by the weight ratio of 25:50:25. Stearin acid AMAIDO (the Nippon Kasei Chemical Co., Ltd. make, melting point of 102 degrees C) as an antiblocking agent 0.7 % of the weight, To the laminated film which carried out dry laminate of a biaxial extension polyethylene terephthalate film and the straight chain-like low density polyethylene by the urethane system anchor coat agent, what mixed the silica (Japanese silica company make) 1% of the weight The gravure reverse coat was carried out so that the thickness after desiccation might be set to 10 micrometers.

[0019] It carried out like the example 1 of a comparison except the ratio of water-emulsion system (adhesives A):(B): (C) of example of comparison 2 ethylene-vinyl acetate copolymerization resin having used the compound blended by the weight ratio of 50:0:50.

[0020] It carried out like the example 1 of a comparison except the ratio of water-emulsion system (adhesives A):(B): (C) of example of comparison 3 ethylene-vinyl acetate copolymerization resin having used the compound blended by the weight ratio of 0:0:100.

[0021] It carried out like the example 1 of a comparison except the ratio of water-emulsion system (adhesives A):(B): (C) of example of comparison 4 ethylene-vinyl acetate copolymerization resin having used the thermal melting arrival agent which mixed stearin acid AMAIDO 5% of the weight as an antiblocking agent for the compound blended by the weight ratio of 0:30:70.

[0022] It carried out like the example 1 of a comparison except the ratio of water-emulsion system (adhesives A):(B): (C) of example of comparison 5 ethylene-vinyl acetate copolymerization resin having used the thermal melting arrival agent which mixed the silica 5% of the weight as an antiblocking agent for the compound blended by the weight ratio of 0:30:70.

[0023]

[Table 1]

	実施例 1	実施例 2	実施例 3	実施例 4	実施例 5
耐ブロッキング性	○	○	○	○	○
内容物付着性	○	○	○	○	○
低温シール性	0. 4 6	0. 3 6	0. 5 0	0. 4 5	0. 3 8
シール温度依存性	○	○	○	○	○
経時変化					
23℃×湿度50%	○	○	○	○	○
60℃×湿度90%	○	○	○	○	○
透明性	7	8	9	9	20
帯電防止性	—	—	—	—	2×10^9

[0024]

[Table 2]

	比較例 1	比較例 2	比較例 3	比較例 4	比較例 5
耐ブロッキング性	○	×	○	×	×
内容物付着性	○	×	○	×	×
低温シール性	0. 3 6	0. 4 0	0. 0 5	0. 3 1	0. 2 9
シール温度依存性	×	×	×	×	×
経時変化					
23℃×湿度50%	○	○	○	○	○
60℃×湿度90%	○	○	○	○	○
透明性	7	9	8	9	13

[0025] The evaluation approach 1 blocking-resistance covering tape of a covering tape was held for 48 hours, where the load of 0.5 kgf/cm² is applied under a 20-sheet pile, the temperature of 60 degrees C, and 90% environment of humidity. O (with no change of ***** and transparency) and x (coherent blocking and transparency fall) were judged from adhesion of the covering tapes in that case, or change of transparency.

2) The contents adhesion covering tape was cut to about 20mm width of face, and the seal was carried out to the carrier tape into which ten IC chips were put. It held in the condition of having made it contents touch a covering tape, in the same conditions as 1), and the case where it had not adhered to a covering tape 48 hours after was made as O, and the case where it had adhered was made into x.

3) The peel strength at the time of carrying out a seal to the embossing tape which formed the pocket in the three-layer sheet which has the surface of PS resin system by which low-temperature seal nature carbon black was scoured in seal head width-of-face 0.5mmx2 for 110 degrees C, seal pressure 0.7MPa, and seal time amount 0.5 seconds was measured in 300 mm/min. A unit is N/mm.

4) The difference of the peel strength at the time of carrying out a seal was calculated in 110 degrees C and 160 degrees C on the same conditions as the seal temperature dependence 3, and when it was less than 30% of the peel strength in 110 degrees C, O and the above thing were made into x.

5) Keep what carried out the seal at 120 degrees C in the same conditions as aging 3 at 50% of temperature humidity of 23 degrees C, and 90% of temperature humidity of 60 degrees C. That whose peel strength of two months after is less than **30% was made into O to initial peel strength, and the thing without that right was made into x.

6) The value of HAZE measured using the transparency hazemeter was shown. A unit is %.

7) the example 5 which added the antistatic nature antistatic agent -- receiving -- JIS-K- it measured using the equipment shown in 6911 and 5.13 under the ambient atmosphere of 50% of temperature humidity of 23 degrees C. Units are omega/**.

[0026]

[Effect of the Invention] According to this invention, the covering tape excellent in transparency, easy-releasability, seal temperature dependence, and stability with the passage of time can be offered.

[Translation done.]